

Weekly Report – week of June 20, 2011  
Fabrication and Assembly of ERL hardware  
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**Cryogenics:** The welding of the last phase one cryogenic transfer line is in process. Survey results from last week on the cryoline interface for the ERL lines came back and a 0.5 inch lateral adjustment was needed. This was completed and the 3 inch process pipe was welded.

The termination of the instrumentation cables at cryoplant's main junction box was finished but termination to field instrumentation was not continued due to powering up of PLC racks for cold test. Termination of field instrumentations of cryoplant will continue after the coldtest.

Oil has been processed for filling in the Sullair compressor (main compressor for plant). Sullair and compressor piping was pressure tested to ensure everything was leak tight before oil is put into compressor. There was leaky gasket that needs replacement.

New relief and burst disk on 1000 Gal liquid helium storage dewar was installed.

**Controls:** Beam Position Monitor instrumentation software development has reached the first milestone of returning data from the Libera module. The interface for the Boonton Pulsed RF Power Meter is now deployed for operational use, and outstanding issues with analog signal digitization used for the 5-cell RF cavity have been addressed as part of wider preparations for the upcoming cold test.

**Instrumentation:** The 1st two PMT beam loss modules are currently being tested in the lab. We're working with the profile manufacturer to rectify some concerns before manufacturing the remaining units. A prototype BNL designed high frequency bypass capacitor for the DCCT system has been fabricated, testing will follow. Bench testing of the ICT electronics is complete, further testing will be done after installation in the racks. We have received the STEP files of the low energy profile monitor from the vendor, these will be incorporated into the BNL beam transport 3D drawings. Five FireWire CCD camera systems have been configured on the bench with hubs for testing of the multi-camera communications interface to the Linux server. An instrumentation block diagram and signals list is being developed to coordinate our efforts with the Controls group.

**Laser:** Repaired laser cooling problem, and laser is operational again. Alignment adjustments were necessary due to large temperature swings the laser has undergone due to climate control problems. Laser locking stability is poor and shows pronounced alignment sensitivity; working on optimizing it in its current configuration and exploring alternative configurations that will make it less sensitive. Working with vacuum group on a window holder design in the transport line that will facilitate use of higher quality windows and simplify swapping of windows for different wavelengths. Climate control in Laser Room remains poor: one AC unit is working, which keeps the temperature within ~5 deg F of the target

temperature. The second unit has a serious problem and is being addressed by HVAC.

**FPC conditioning:** The water leak repair to the ERL FPC airside inner conductor has been completed and pressure and vacuum tested. We have reassembled the FPC's and will continue testing as schedule permits. A new FPC inner conductor has been ordered by AES to replace the repaired one for final assembly into the cryomodule. We still need to understand the water flow rates for proper cooling at high power operations.

**Photocathode:** The first attempt of making a multialkali photocathode in the deposition is in progress. We have deposited Antimony (Sb) and Cesium (Cs). A laser and a current meter have been set-up to measure the current of the photocathode. We have learned that additional pumping and vacuum gauging is required for the source arms to protect the activated sources. A PO has been submitted for the purchase of more vacuum gauging. We are looking into the pricing to add ion pumps to the arms while the sources are stored behind their respective isolation valves. The fluctuation in the current driving the Cs needs to be minimized. The source of this fluctuation is being investigated.

**Gun Cryomodule:** The gun and string assembly are further delayed for processing at J-Lab due to an issue with J-Lab re-qualifying their cleaning facility. The first part for the transport cart upgrade has been received from the fabrication shop.

**PASS System:** The installation and testing of the VTF PASS system is moving forward now the cable tray is reinstalled. The electrical power hooked-up has been scheduled .

**Mezzanine:** An RFQ to raise the mezzanine two feet has been prepared and is awaiting work control review. This will accommodate the requirements for the processing of the 56MHz cavity in the clean room that is being proposed to reside underneath.

**Large Grain Gun:** Gun processing is currently taking place at Jefferson Laboratory. Design for magnetic shielding for test Dewar has been finalized, and components are being manufactured at vendor (Amuneal).

**5-cell cavity/cryomodule:** The paperwork continues for the G-5 test safety review. The surveyors have started to verify locations of the faraday cups (beam dumps) for the G-5 test. An new date of June 30th has been set for the next 5 cell run to test the LLRF feedback loop.

**ERL injection line:** Vacuum envelope is in preparation to final review, correction magnets are under design.

**ERL Extraction line:** Magnets are being fabricated; beam dump pressure vessel code compliance under evaluation, vacuum/instrumentation layout needs to be reviewed and finalized.